

I claim:

1. A flexible guidewire system with an exposed midsection, for crossing an obstruction located in a patient's vessel, comprising in combination:

a flexible pilot wire;

a flexible casing having a tubular distal portion made of a helical wire that is gated at its distal end, said distal portion being slidable and rotatable over said pilot wire;

a thin elongated midsection connected to said distal portion, said midsection disposed alongside said pilot wire and is slidable along and rotatable around said pilot wire; and

a proximal tubular coupling for rotating and linearly moving said casing over said pilot wire, said coupling being slidable and rotatable over said pilot wire and being connected to said midsection,

wherein a section of said pilot wire that is disposed alongside said midsection of said casing is exposed.

2. As in claim 1, wherein said distal end of said flexible casing is gated by a tube section that is attached to said helical wire.

3. As in claim 1, wherein said distal end of said casing is gated by closely wound coils of said helical wire.

4. As in claim 1, wherein said a midsection of said casing is made of a substantially straight wire that is a continuation of a wire of which said helical wire is made of.

5. As in claim 1, wherein said distal portion of said casing is curved.

6. As in claim 1, wherein said flexible pilot wire is a standard guidewire.

7. As in claim 1, wherein said flexible pilot wire comprises a hollow tube.

8. As in claim 1, wherein said flexible pilot wire comprises a hollow tube having a chamber attached to its distal end section, said chamber being inflatable through said hollow tube.

9. As in claim 1, wherein the flexible guidewire system is disposed in a sleeve with a biasing means to deflect the position of said casing in said vessel.

10. As in claim 9, wherein said biasing means comprises a sleeve with a curved distal end section.

11. As in claim 9, wherein said biasing means comprises a sleeve with a selectively inflatable chamber located at said distal end of said sleeve.

12. A method for crossing an obstruction in a patient's vessel using a flexible guidewire system with an exposed midsection that comprises a flexible pilot wire; a flexible casing with a tubular distal portion that is slidable and rotatable over said pilot wire, a thin elongated midsection disposed alongside, slidable along and rotatable around said pilot wire, and a proximal tubular coupling connected to said

midsection, said coupling being slidable along and rotatable over said pilot wire and wherein a section of said pilot that is disposed alongside said midsection of said casing is exposed, said method comprising the following steps:

inserting a distal end of said flexible pilot wire to the vessel and, while holding the pilot wire, inserting over its proximal end the distal portion of the casing;

advancing the distal portion of the casing over the pilot wire until the proximal end of the distal portion of the casing is past the proximal end of the pilot wire and then shifting the holding point to an exposed point along the pilot wire;

continuing to advance the casing and then inserting the proximal end of the pilot wire into a distal end of a tubular coupling while continuing to hold the pilot wire at a point at which it is exposed;

advancing the coupling over the pilot wire until its is past the proximal end of the pilot wire and then shifting the holding point to a point on the pilot wire that is proximal to the coupling; and

advancing and rotating said casing by rotating said coupling and thereby threading said distal portion of said casing through the obstruction.

13. As in claim 12, wherein a portion of said flexible pilot wire is inserted distally to said flexible casing, into said vessel, and provides a lever arm to angularly align said flexible casing with said vessel.

15. A method for crossing an obstruction in a patient's vessel using a flexible guidewire system with an exposed midsection that comprises a flexible pilot wire; a flexible casing with a tubular distal portion that is slidable and rotatable over said pilot wire, a thin elongated midsection disposed alongside, slidable along and rotatable around said pilot wire, and a proximal tubular coupling connected to said midsection, said coupling being slidable along and rotatable over said pilot wire and wherein a section of said pilot that is disposed alongside said midsection of said casing is exposed, said method comprising the following steps:

inserting a distal end of said flexible pilot wire to the vessel and, while holding the pilot wire, inserting over its proximal end the distal portion of the casing;

advancing the distal portion of the casing past the proximal end of the pilot wire and then shifting the holding point to an exposed point along the pilot wire;

continuing to advance the casing and then inserting the proximal end of the pilot wire into a distal end of a tubular coupling while continuing to hold the pilot wire at a point at which it is exposed;

advancing the coupling over the pilot wire until it is past the proximal end of the pilot wire and then shifting the holding point to a point on the pilot wire that is proximal to the coupling;

advancing and rotating said casing by rotating said coupling and thereby threading said distal portion of said casing into the obstruction, beyond the distal tip of the pilot wire, and threading it across the obstruction

advancing the pilot wire across the obstruction and,

withdrawing the casing, leaving the pilot wire in place.

16. As in claim 15 wherein withdrawing the casing leaving the pilot wire in place comprises the following steps:

holding the pilot wire at a point at which it is exposed and withdrawing the coupling and then shifting the holding point to a point on the pilot wire that is distal to the distal portion of the casing: and

withdrawing the distal portion of the casing.